

Tab A

Applicant: John S. Lollar  
Appln. Serial No: 10/813,507  
Filing Date: March 30, 2004



Title: NUCLEIC ACID AND AMINO ACID SEQUENCES ENCODING HIGH-LEVEL  
EXPRESSOR FACTOR VIII POLYPEPTIDES AND METHODS OF USE

Appendix A

CLUSTAL W (1.82) multiple sequence alignment for SEQ ID NO: 15, 17, and 19

```
SEQIDNO_15.      MQLELSTCVFLCLPLGFSAIRRYLGAVELSWDYRQSELLRELHVDTRFPATAPGALPL 60
SEQIDNO_19.      MQLELSTCVFLCLPLGFSAIRRYLGAVELSWDYRQSELLRELHVDTRFPATAPGALPL 60
SEQIDNO_17.      MQLELSTCVFLCLPLGFSAIRRYLGAVELSWDYRQSELLRELHVDTRFPATAPGALPL 60
                  *****
SEQIDNO_15.      GPSVLKYKTVFEFTDQLFSVARPRPPNMGLLGPTIQAEVYDVTVVTLKNMASHPVSLHA 120
SEQIDNO_19.      GPSVLKYKTVFEFTDQLFSVARPRPPNMGLLGPTIQAEVYDVTVVTLKNMASHPVSLHA 120
SEQIDNO_17.      GPSVLKYKTVFEFTDQLFSVARPRPPNMGLLGPTIQAEVYDVTVVTLKNMASHPVSLHA 120
                  *****
SEQIDNO_15.      VGVSFWKSSSEGAEYEDHTSQREKEDDKVLPKKSQTYVWQVLKENGPTASDPPCLTYSYLS 180
SEQIDNO_19.      VGVSFWKSSSEGAEYEDHTSQREKEDDKVLPKKSQTYVWQVLKENGPTASDPPCLTYSYLS 180
SEQIDNO_17.      VGVSFWKSSSEGAEYEDHTSQREKEDDKVLPKKSQTYVWQVLKENGPTASDPPCLTYSYLS 180
                  *****
SEQIDNO_15.      HVDLVKDLNSGLIGALLVCREGSLTRETONLHEFVLLFAVFDEGKSWHSARNDSWTRAM 240
SEQIDNO_19.      HVDLVKDLNSGLIGALLVCREGSLTRETONLHEFVLLFAVFDEGKSWHSARNDSWTRAM 240
SEQIDNO_17.      HVDLVKDLNSGLIGALLVCREGSLTRETONLHEFVLLFAVFDEGKSWHSARNDSWTRAM 240
                  *****
SEQIDNO_15.      DPAPARAQPAMHTVNGVYVNRSLPGLIGCHKKSVYWHVIGMGTSPEVHSIFLEGHTFLVRH 300
SEQIDNO_19.      DPAPARAQPAMHTVNGVYVNRSLPGLIGCHKKSVYWHVIGMGTSPEVHSIFLEGHTFLVRH 300
SEQIDNO_17.      DPAPARAQPAMHTVNGVYVNRSLPGLIGCHKKSVYWHVIGMGTSPEVHSIFLEGHTFLVRH 300
                  *****
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SEQIDNO\_15. HRQASLEISPLTFLTAQTFMLDGLQFLFCHISSHHHGGMEAHVRVESCABEPPQLRRKAD 360  
SEQIDNO\_19. HRQASLEISPLTFLTAQTFMLDGLQFLFCHISSHHHGGMEAHVRVESCABEPPQLRRKAD 360  
SEQIDNO\_17. HRQASLEISPLTFLTAQTFMLDGLQFLFCHISSHHHGGMEAHVRVESCABEPPQLRRKAD 360  
\*\*\*\*\*

SEQIDNO\_15. EEEDYDDNLYSDMDVRLDGGDVSPFIQIRSVAKKHPKTWVHYISABEEDWDYAPAVPS 420  
SEQIDNO\_19. EEEDYDDNLYSDMDVRLDGGDVSPFIQIRSVAKKHPKTWVHYISABEEDWDYAPLVLA 420  
SEQIDNO\_17. EEEDYDDNLYSDMDVRLDGGDVSPFIQIRSVAKKHPKTWVHYISABEEDWDYAPLVLA 420  
\*\*\*\*\*

SEQIDNO\_15. PSDRYSKSLVNSGPQIRGRKYKKARFVAYTDVTFKTRKAIPYESGILGPLLYGEVGDTL 480  
SEQIDNO\_19. PDDRSYKQVLLNNGPQIRGRKYKKVRFAYTDETFKTREAIQHESGILGPLLYGEVGDTL 480  
SEQIDNO\_17. PDDRSYKQVLLNNGPQIRGRKYKKVRFAYTDETFKTREAIQHESGILGPLLYGEVGDTL 480  
\*\*\*\*\*

SEQIDNO\_15. LIIFKNKASRPYNIYPHGITDVSAHPGRLKKGWKHLKDMPILPGETFKYKWTVTVEDGP 540  
SEQIDNO\_19. LIIFKNQASRPYNIYPHGITDVRLPYSRRLPKGVKHLKDFPILPGEIFKYKWTVTVEDGP 540  
SEQIDNO\_17. LIIFKNQASRPYNIYPHGITDVRLPYSRRLPKGVKHLKDFPILPGEIFKYKWTVTVEDGP 540  
\*\*\*\*\*

SEQIDNO\_15. TKSDPRCLTRYSSINLEKOLASGLIGPLLI CYKESVDQQRGNQMSDKRNVLFSVFDE 600  
SEQIDNO\_19. TKSDPRCLTRYSSFVNMERDLASGLIGPLLI CYKESVDQQRGNQMSDKRNVLFSVFDE 600  
SEQIDNO\_17. TKSDPRCLTRYSSFVNMERDLASGLIGPLLI CYKESVDQQRGNQMSDKRNVLFSVFDE 600  
\*\*\*\*\*

SEQIDNO\_15. NQSWYLAENIQRFPLPNPDGLQPDPEFQASNIHMSINGYVFDLSQLSVCLHEVAYWYILS 660  
SEQIDNO\_19. NRSWLTENIQRFPLPNPAGVQLEDPFQASNIHMSINGYVFDLSQLSVCLHEVAYWYILS 660  
SEQIDNO\_17. NRSWLTENIQRFPLPNPAGVQLEDPFQASNIHMSINGYVFDLSQLSVCLHEVAYWYILS 660  
\*\*\*\*\*

SEQIDNO\_15. VQAQTDFLSVFFSGYTFKHKMVYEDTLTLPFSGETVFMSMENPGLWVLGCHNSDLNRG 720  
SEQIDNO\_19. IGAQTDFLSVFFSGYTFKHKMVYEDTLTLPFSGETVFMSMENPGLWILGCHNSDFNRG 720  
SEQIDNO\_17. IGAQTDFLSVFFSGYTFKHKMVYEDTLTLPFSGETVFMSMENPGLWILGCHNSDFNRG 720

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: ****
SEQIDNO_15. MTALLKVSCDRDIGDYDNTYEDIPGFLLSGKNVIEPRSFQNSRPPSASAKPPVLR 780
SEQIDNO_19. MTALLKVSSCDKNTGDIYEDSYEDISAYLLSKNNAIEPRSFQNSRPPSASAKPPVLR 780
SEQIDNO_17. MTALLKVSSCDKNTGDIYEDSYEDISAYLLSKNNAIEPRSFQN-----PPVLR 770
***** ***: ****::****:***:*.*****:** ****:
HQRDISLPTFQPEEDKMDYDDIFSTETKGEDFDIYGEDENQDPRSFQKRTRHYFIAAVEQ 840
HQRDISLPTFQPEEDKMDYDDIFSTETKGEDFDIYGEDENQDPRSFQKRTRHYFIAAVEQ 840
HQREITRTLQSDQEEIDYDDTISVEMKKEDFDIYEDENQSPRSFQKRTRHYFIAAVER 830
***:*.***:****:***:*.*****:****:*****:*****:*****:
LWDYGMSSEPRALNRNAQNGEVPFRKKWVFREFADGSFTQPSYRGELNKHGLLGPYIRA 900
LWDYGMSSEPRALNRNAQNGEVPFRKKWVFREFADGSFTQPSYRGELNKHGLLGPYIRA 900
LWDYGMSSEPHVLRNRAQSGSVQPFKKWVQEFDTGSFTQPLYRGELNEHGLLGPYIRA 890
*****.*.:*****.*.***:*****:***:***** *****:*****
EVEDNIMVTFKNQASRPYSFYSSLSISYPDDQEQGAEPHRNFVQPNETRYFWKVQHMAP 960
EVEDNIMVTFKNQASRPYSFYSSLSISYPDDQEQGAEPHRNFVQPNETRYFWKVQHMAP 960
EVEDNIMVTFRNQASRPYSFYSSLSISYEEDQRGAEPKRFVKPNETKTYFWKVQHMAP 950
*****:*****:*****:***:*****:***:*****:*****
TEDEFCKAWAYFSDVLEKDVHSGSLIGPLLICRANTLNAAHGRQVTVQEFALFFTFIDE 1020
TEDEFCKAWAYFSDVLEKDVHSGSLIGPLLICRANTLNAAHGRQVTVQEFALFFTFIDE 1020
TKDEFCKAWAYFSDVLEKDVHSGSLIGPLLVCHTNTLNPAGHRQVTVQEFALFFTFIDE 1010
*:*****:*****:*****:***:*****:*****:*****:*****
TKSWYFTENVERNCRAPCHLQMEDPTLKENYRFAINGYVMDTLPGLVMAQNQRIRWYLL 1080
TKSWYFTENVERNCRAPCHLQMEDPTLKENYRFAINGYVMDTLPGLVMAQNQRIRWYLL 1080
TKSWYFTENMERNCRAPCNITQMEDPTFKENYRFAINGYIMDTLPGLVMAQDQRIRWYLL 1070
*****:*****:*****:*****:*****:*****:*****:*****

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SEQIDNO_15.	LQAGSTTFLVYSKKCQTPLGMASGHIRDFQITASQYGQWAPKLARLHYSGSINAWSTK	1200
SEQIDNO_19.	LQAGSTTFLVYSKKCQTPLGMASGHIRDFQITASQYGQWAPKLARLHYSGSINAWSTK	1200
SEQIDNO_17.	LHAGSTLFLVYSNKKCQTPLGMASGHIRDFQITASQYGQWAPKLARLHYSGSINAWSTK	1190
	*:*****	*****

SEQIDNO_15.	FFGNVDSSGIIKHNIFNPPIIARYIRLHPHYISIRSTLRMELMGCDLNSCSMPLGNESKAI	1320
SEQIDNO_19.	FFGNVDSSGIIKHNIFNPPIIARYIRLHPHYISIRSTLRMELMGCDLNSCSMPLGNESKAI	1320
SEQIDNO_17.	FFGNVDSSGIIKHNIFNPPIIARYIRLHPHYISIRSTLRMELMGCDLNSCSMPLGNESKAI	1310
	*****	*****

SEQIDNO_15.	QGVKSLTSMYVKEFLISSSQDGHQWTLFFQNGKVKVFQGNQDSFTPVNSLDPPLTRY	1440
SEQIDNO_19.	QGVKSLTSMYVKEFLISSSQDGHQWTLFFQNGKVKVFQGNQDSFTPVNSLDPPLTRY	1440
SEQIDNO_17.	QGVKSLTSMYVKEFLISSSQDGHQWTLFFQNGKVKVFQGNQDSFTPVNSLDPPLTRY	1430
	*****	*****

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SEQIDNO\_15. LRIHPQSWVHQIALRMEVLGCEAQDLY 1467  
SEQIDNO\_19. LRIHPQSWVHQIALRMEVLGCEAQDLY 1467  
SEQIDNO\_17. LRIHPQSWVHQIALRMEVLGCEAQDLY 1457  
\*\*\*\*\*

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APPENDIX B

CLUSTAL W (1.82) multiple sequence alignment for SEQ ID NO: 14, 16, and 18

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SEQIDNO_14      ATGCAGCTAGAGCTCCACCTGTGTCTTTCTGTCTCTTGTCCACTCGGCTTTAGTGCC 60
SEQIDNO_18      ATGCAGCTAGAGCTCCACCTGTGTCTTTCTGTCTCTTGTCCACTCGGCTTTAGTGCC 60
SEQIDNO_16      ATGCAGCTAGAGCTCCACCTGTGTCTTTCTGTCTCTTGTCCACTCGGCTTTAGTGCC 60
*****
SEQIDNO_14      ATCAGGAGATACTAGCTGGCGCAGTGGAACTGTCTCTGGGACTACCGGCAAGTGAATC 120
SEQIDNO_18      ATCAGGAGATACTAGCTGGCGCAGTGGAACTGTCTCTGGGACTACCGGCAAGTGAATC 120
SEQIDNO_16      ATCAGGAGATACTAGCTGGCGCAGTGGAACTGTCTCTGGGACTACCGGCAAGTGAATC 120
*****
SEQIDNO_14      CTCGGTGAGCTGCACGTGGACACCAGATTTCCTGCTACAGCGCCAGGAGCTCTTCCGTTG 180
SEQIDNO_18      CTCGGTGAGCTGCACGTGGACACCAGATTTCCTGCTACAGCGCCAGGAGCTCTTCCGTTG 180
SEQIDNO_16      CTCGGTGAGCTGCACGTGGACACCAGATTTCCTGCTACAGCGCCAGGAGCTCTTCCGTTG 180
*****
SEQIDNO_14      GGCCCGTCAGTCCTGTACAAAAGACTGTGTCTGTAGAGTTCACGGATCAACTTTTCAGC 240
SEQIDNO_18      GGCCCGTCAGTCCTGTACAAAAGACTGTGTCTGTAGAGTTCACGGATCAACTTTTCAGC 240
SEQIDNO_16      GGCCCGTCAGTCCTGTACAAAAGACTGTGTCTGTAGAGTTCACGGATCAACTTTTCAGC 240
*****
SEQIDNO_14      GTTGCCAGGCCCGCAGGCCACCATTGGATGGGTCTGTGGTCTCTACCATCCAGGCTGAGGTT 300
SEQIDNO_18      GTTGCCAGGCCCGCAGGCCACCATTGGATGGGTCTGTGGTCTCTACCATCCAGGCTGAGGTT 300
SEQIDNO_16      GTTGCCAGGCCCGCAGGCCACCATTGGATGGGTCTGTGGTCTCTACCATCCAGGCTGAGGTT 300
*****
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SEQIDNO\_14 TACGACACGGTGGTGGTTACCCCTGAAGAACATGGCTTCTCATCCGTTAGTCTTCACGCT 360  
SEQIDNO\_18 TACGACACGGTGGTGGTTACCCCTGAAGAACATGGCTTCTCATCCGTTAGTCTTCACGCT 360  
SEQIDNO\_16 TACGACACGGTGGTGGTTACCCCTGAAGAACATGGCTTCTCATCCGTTAGTCTTCACGCT 360  
\*\*\*\*\*

SEQIDNO\_14 GTCGGCGTCTCCTTCTGGAATCTTCGGAAGCGCTGAATATGAGGATCACACCAGCCAA 420  
SEQIDNO\_18 GTCGGCGTCTCCTTCTGGAATCTTCGGAAGCGCTGAATATGAGGATCACACCAGCCAA 420  
SEQIDNO\_16 GTCGGCGTCTCCTTCTGGAATCTTCGGAAGCGCTGAATATGAGGATCACACCAGCCAA 420  
\*\*\*\*\*

SEQIDNO\_14 AGGAGAAGGAAGACGATAAAGTCTTCCCGGTAAAGCCAAACCTACGTCTGGCAGGTC 480  
SEQIDNO\_18 AGGAGAAGGAAGACGATAAAGTCTTCCCGGTAAAGCCAAACCTACGTCTGGCAGGTC 480  
SEQIDNO\_16 AGGAGAAGGAAGACGATAAAGTCTTCCCGGTAAAGCCAAACCTACGTCTGGCAGGTC 480  
\*\*\*\*\*

SEQIDNO\_14 CTGAAAGAAAATGGTCCAAACAGCCTCTGACCCACCATGTCTTACCTACTCATACCTGTCT 540  
SEQIDNO\_18 CTGAAAGAAAATGGTCCAAACAGCCTCTGACCCACCATGTCTTACCTACTCATACCTGTCT 540  
SEQIDNO\_16 CTGAAAGAAAATGGTCCAAACAGCCTCTGACCCACCATGTCTTACCTACTCATACCTGTCT 540  
\*\*\*\*\*

SEQIDNO\_14 CACGTGGACCTGGTGAAGACCTGAATTCGGGCCCTCATTGGAGCCCTGCTGGTTGTAGA 600  
SEQIDNO\_18 CACGTGGACCTGGTGAAGACCTGAATTCGGGCCCTCATTGGAGCCCTGCTGGTTGTAGA 600  
SEQIDNO\_16 CACGTGGACCTGGTGAAGACCTGAATTCGGGCCCTCATTGGAGCCCTGCTGGTTGTAGA 600  
\*\*\*\*\*

SEQIDNO\_14 GAAGGGAGTCTGACCAAGAGAACGACCCAGAACCTGCACGAATTTGTACTACTTTTGCT 660  
SEQIDNO\_18 GAAGGGAGTCTGACCAAGAGAACGACCCAGAACCTGCACGAATTTGTACTACTTTTGCT 660  
SEQIDNO\_16 GAAGGGAGTCTGACCAAGAGAACGACCCAGAACCTGCACGAATTTGTACTACTTTTGCT 660  
\*\*\*\*\*

SEQIDNO\_14 GTCTTTGATGAAGGGAAAAGTTGGCACTCAGCAAGAAATGACTCCTGGACACGGGCCATG 720  
SEQIDNO\_18 GTCTTTGATGAAGGGAAAAGTTGGCACTCAGCAAGAAATGACTCCTGGACACGGGCCATG 720  
SEQIDNO\_16 GTCTTTGATGAAGGGAAAAGTTGGCACTCAGCAAGAAATGACTCCTGGACACGGGCCATG 720  
\*\*\*\*\*



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```
SEQIDNO_14      GATCCCGCACCTGCCAGGSCCCAGCCTGCAATGCACACAGTCAATGGCTATGTCAACAGG 780
SEQIDNO_18      GATCCCGCACCTGCCAGGSCCCAGCCTGCAATGCACACAGTCAATGGCTATGTCAACAGG 780
SEQIDNO_16      GATCCCGCACCTGCCAGGSCCCAGCCTGCAATGCACACAGTCAATGGCTATGTCAACAGG 780
*****
SEQIDNO_14      TCTCTGCCAGGTCGTATCGGATGTCATAAGAAATCAGTCTACTGGCACGTGATTGGAATG 840
SEQIDNO_18      TCTCTGCCAGGTCGTATCGGATGTCATAAGAAATCAGTCTACTGGCACGTGATTGGAATG 840
SEQIDNO_16      TCTCTGCCAGGTCGTATCGGATGTCATAAGAAATCAGTCTACTGGCACGTGATTGGAATG 840
*****
SEQIDNO_14      GGCACACAGCCCGGAAGTGCACTCCATTTTCTTGAAGGCCACACGTTTCTCGTGAGGCAC 900
SEQIDNO_18      GGCACACAGCCCGGAAGTGCACTCCATTTTCTTGAAGGCCACACGTTTCTCGTGAGGCAC 900
SEQIDNO_16      GGCACACAGCCCGGAAGTGCACTCCATTTTCTTGAAGGCCACACGTTTCTCGTGAGGCAC 900
*****
SEQIDNO_14      CATCGCCAGGCTTCCTTGGAGATCTCGCCACTAACTTTCCTCACTGCTCAGACATTCCCTG 960
SEQIDNO_18      CATCGCCAGGCTTCCTTGGAGATCTCGCCACTAACTTTCCTCACTGCTCAGACATTCCCTG 960
SEQIDNO_16      CATCGCCAGGCTTCCTTGGAGATCTCGCCACTAACTTTCCTCACTGCTCAGACATTCCCTG 960
*****
SEQIDNO_14      ATGGACCTTGGCCAGTTCCTACTGTTTGTCAATCTCTTCCACCACCACCATGGTGGCATG 1020
SEQIDNO_18      ATGGACCTTGGCCAGTTCCTACTGTTTGTCAATCTCTTCCACCACCACCATGGTGGCATG 1020
SEQIDNO_16      ATGGACCTTGGCCAGTTCCTACTGTTTGTCAATCTCTTCCACCACCACCATGGTGGCATG 1020
*****
SEQIDNO_14      GAGGCTCAGTCAGAGTAGAAAGCTGCGCCGAGGAGCCCCAGCTGCGGAGGAAAGCTGAT 1080
SEQIDNO_18      GAGGCTCAGTCAGAGTAGAAAGCTGCGCCGAGGAGCCCCAGCTGCGGAGGAAAGCTGAT 1080
SEQIDNO_16      GAGGCTCAGTCAGAGTAGAAAGCTGCGCCGAGGAGCCCCAGCTGCGGAGGAAAGCTGAT 1080
*****
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SEQIDNO\_14 GAAGAGGAAGATTATGATGACAATTTGTACGACTCGGACATGGACGTGGTCCGGCTCGAT 1140  
SEQIDNO\_18 GAAGAGGAAGATTATGATGACAATTTGTACGACTCGGACATGGACGTGGTCCGGCTCGAT 1140  
SEQIDNO\_16 GAAGAGGAAGATTATGATGACAATTTGTACGACTCGGACATGGACGTGGTCCGGCTCGAT 1140  
\*\*\*\*\*

SEQIDNO\_14 GGTGACGACGTGTCCTCCCTTTATCCAAATCCGCTCGGTGCGCAAGACATCCCAAAACC 1200  
SEQIDNO\_18 GGTGACGACGTGTCCTCCCTTTATCCAAATCCGCTCAGTTGCCAAGAAGCATCCTAAAACT 1200  
SEQIDNO\_16 GGTGACGACGTGTCCTCCCTTTATCCAAATCCGCTCAGTTGCCAAGAAGCATCCTAAAACT 1200  
\*\*\*\*\*

SEQIDNO\_14 TGGGTGCACATCTGACAGAGGAGGAGGACTGGGACTACGCCCCCGGGTCCCCAGC 1260  
SEQIDNO\_18 TGGGTACATTACATTGCTGCTGAAGAGGAGGACTGGGACTATGCTCCCTTAGTCTCGCC 1260  
SEQIDNO\_16 TGGGTACATTACATTGCTGCTGAAGAGGAGGACTGGGACTATGCTCCCTTAGTCTCGCC 1260  
\*\*\*\*\*

SEQIDNO\_14 CCCAGTGACAGAAAGTTATAAAAGTCTCTACTTTGAACAGTGGTCTCAGCGAATTGGTAGG 1320  
SEQIDNO\_18 CCCGATGACAGAAAGTTATAAAAGTCAATATTTGAACAATGGCCCTCAGCGGATTGGTAGG 1320  
SEQIDNO\_16 CCCGATGACAGAAAGTTATAAAAGTCAATATTTGAACAATGGCCCTCAGCGGATTGGTAGG 1320  
\*\*\*\*\*

SEQIDNO\_14 AAATACAAAAAGTCGATTGCTCGCTTACACGGATGTAACATTTAAGACTCGTAAAGCT 1380  
SEQIDNO\_18 AAGTACAAAAAGTCGATTGTCATACACAGATGAACCTTTAAGACGCGTGAAGCT 1380  
SEQIDNO\_16 AAGTACAAAAAGTCGATTGTCATACACAGATGAACCTTTAAGACGCGTGAAGCT 1380  
\*\*\*\*\*

SEQIDNO\_14 ATTCGATGATCAGGAATCCTGGGACCTTTACTTTATGGAGAAGTTGGAGACACACTT 1440  
SEQIDNO\_18 ATTCAGCATGAATCAGGAATCTTGGGACCTTTACTTTATGGGAAGTTGGAGACACACTG 1440  
SEQIDNO\_16 ATTCAGCATGAATCAGGAATCTTGGGACCTTTACTTTATGGGAAGTTGGAGACACACTG 1440  
\*\*\*\*\*

SEQIDNO\_14 TTGATTATATTTAAGAAATAAGCGAGCCGACCATATAACATCTACCCCTCATGGAATCACT 1500  
SEQIDNO\_18 TTGATTATATTTAAGAAATCAAGCAAGCAGACCATATAACATCTACCCCTCAGGAATCACT 1500  
SEQIDNO\_16 TTGATTATATTTAAGAAATCAAGCAAGCAGACCATATAACATCTACCCCTCAGGAATCACT 1500

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SEQIDNO_14	GATGTCAGCGCTTTGCA	1560
SEQIDNO_18	GATGTCAGCGCTTTGCA	1560
SEQIDNO_16	GATGTCAGCGCTTTGCA	1560
SEQIDNO_14	CCAATTCTGCCAGGAGAGACTTTCAAGTATATAATGGACAGTCACTGTGGAAAGATGGGCCA	1620
SEQIDNO_18	CCAATTCTGCCAGGAGAGAAATATTCAAAATATAAATGGACAGTCACTGTAGAAAGATGGGCCA	1620
SEQIDNO_16	CCAATTCTGCCAGGAGAGAAATATTCAAAATATAAATGGACAGTCACTGTAGAAAGATGGGCCA	1620
SEQIDNO_14	ACCAAGTCGGATCCTCGGTGCGCTGACCGGCTACTACTCGAGTCCATTAATCTAGAGAAA	1680
SEQIDNO_18	ACTAAATCAGATCCGCGGTGCGCTGACCGGCTATTACTCTAGTTTCGTTAATATGGAGAGA	1680
SEQIDNO_16	ACTAAATCAGATCCGCGGTGCGCTGACCGGCTATTACTCTAGTTTCGTTAATATGGAGAGA	1680
SEQIDNO_14	GATCTGGCTTCGGGACTCATTTGGCCCTCTCCTCATCTGCTACAAAGAACTCTGTAGACCAA	1740
SEQIDNO_18	GATCTAGCTTCAGGACTCATTTGGCCCTCTCCTCATCTGCTACAAAGAACTCTGTAGATCAA	1740
SEQIDNO_16	GATCTAGCTTCAGGACTCATTTGGCCCTCTCCTCATCTGCTACAAAGAACTCTGTAGATCAA	1740
SEQIDNO_14	AGAGGAAACCAAGATGATGTCAGACAAGAGAAAACGTCATCCTGTTTTCTGTAATTCGATGAG	1800
SEQIDNO_18	AGAGGAAACCAAGATAATGTCAGACAAGAGGAATGTCATCCTGTTTTCTGTAATTCGATGAG	1800
SEQIDNO_16	AGAGGAAACCAAGATAATGTCAGACAAGAGGAATGTCATCCTGTTTTCTGTAATTCGATGAG	1800
SEQIDNO_14	AATCAAAGTGGTACCTCGCAGAGAAATATTACAGCGCTTCTCCCAATCCGGATGGATT	1860
SEQIDNO_18	AACCGAAGTGGTACCTCACAGAGAAATATACAACGCTTCTCCCAATCCAGCTGGAGTG	1860
SEQIDNO_16	AACCGAAGTGGTACCTCACAGAGAAATATACAACGCTTCTCCCAATCCAGCTGGAGTG	1860

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SEQIDNO\_14 CAGCCCCAGGATCCGAGTTCGAAGCTTCTAACATCATGCACAGCATCAATGGCTATGTT 1920  
SEQIDNO\_18 CAGCTTGAGGATCCGAGTTCGAAGCTTCTAACATCATGCACAGCATCAATGGCTATGTT 1920  
SEQIDNO\_16 CAGCTTGAGGATCCGAGTTCGAAGCTTCTAACATCATGCACAGCATCAATGGCTATGTT 1920  
\*\*\*\* \* \* \* \* \*

SEQIDNO\_14 TTTGATAGCTTGCAGCTGTGGTTTGTGTCACGAGGTGGCATACTGGTACATTCTAAGT 1980  
SEQIDNO\_18 TTTGATAGTTTGCAGTTGTGAGTTTGTGTCAGGTGGCATACTGGTACATTCTAAGC 1980  
SEQIDNO\_16 TTTGATAGTTTGCAGTTGTGAGTTTGTGTCAGGTGGCATACTGGTACATTCTAAGC 1980  
\*\*\*\* \* \* \* \* \*

SEQIDNO\_14 GTTGAGCACAGACGGACTTCTCTCCGCTTCTTCTCTGGTACACCTTCAAAACACAAA 2040  
SEQIDNO\_18 ATTGAGCACAGACTGACTTCTTCTGCTTCTTCTCTGGATATACCTTCAAAACACAAA 2040  
SEQIDNO\_16 ATTGAGCACAGACTGACTTCTTCTGCTTCTTCTCTGGATATACCTTCAAAACACAAA 2040  
\*\*\*\* \* \* \* \* \*

SEQIDNO\_14 ATGGTCTATGAAGACACACTCACCCCTGTTCCCTTCTCAGGAGAAACGGTCTTCATGTCA 2100  
SEQIDNO\_18 ATGGTCTATGAAGACACACTCACCCCTATTCCTTCTCAGGAGAAACGTCTTCATGTG 2100  
SEQIDNO\_16 ATGGTCTATGAAGACACACTCACCCCTATTCCTTCTCAGGAGAAACGTCTTCATGTG 2100  
\*\*\*\* \* \* \* \* \*

SEQIDNO\_14 ATGGAACCCAGGTCTCTGGTCTTGGGTGCCACAACCTCAGACTTGGGAAACAGAGG 2160  
SEQIDNO\_18 ATGGAACCCAGGTCTATGGATTCTGGGTGCCACAACCTCAGACTTGGGAAACAGAGG 2160  
SEQIDNO\_16 ATGGAACCCAGGTCTATGGATTCTGGGTGCCACAACCTCAGACTTGGGAAACAGAGG 2160  
\*\*\*\* \* \* \* \* \*

SEQIDNO\_14 ATGACAGCCTTACTGAAGGTGTATAGTTGTGACAGGGACATTGGTGATTATTATGACAAC 2220  
SEQIDNO\_18 ATGACCGCTTACTGAAGGTTTCTAGTTGTGACAAGAACACCTGGTGATTATTACGAGGAC 2220  
SEQIDNO\_16 ATGACCGCTTACTGAAGGTTTCTAGTTGTGACAAGAACACCTGGTGATTATTACGAGGAC 2220  
\*\*\*\* \* \* \* \* \*

SEQIDNO\_14 ACTTATGAAGATATTCCAGGCTTCTTGCTGAGTGGAAAGAATGTCAATTGAACCTAGGAGC 2280  
SEQIDNO\_18 AGTTATGAAGATATTTTCAGCATACTTGTGAGTAAACAATGCCATTGAACCTAGGAGC 2280  
SEQIDNO\_16 AGTTATGAAGATATTTTCAGCATACTTGTGAGTAAACAATGCCATTGAACCTAGGAGC 2280  
\*\*\*\* \* \* \* \* \*

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SEQIDNO\_14 CCGTCGTACCGGGGGAACCAACAACACATTGGGGCTCTTGGGACCTACATCAGAGCG 2700  
SEQIDNO\_18 CCGTCGTACCGGGGGAACCAACAACACATTGGGGCTCTTGGGACCTACATCAGAGCG 2700  
SEQIDNO\_16 CCCTTATACCGTGGAGAACTAATGAACATTGGGACTCCTGGGGCCATATATAAGAGCA 2670  
\*\* \* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\*

SEQIDNO\_14 GAAGTTGAAGACAACATCATGTGTAACCTTCAAAAACCAGGCGTCTCGTCCCTATTCCCTTC 2760  
SEQIDNO\_18 GAAGTTGAAGACAACATCATGTGTAACCTTCAAAAACCAGGCGTCTCGTCCCTATTCCCTTC 2760  
SEQIDNO\_16 GAAGTTGAAGATAATATCATGTGTAACCTTCAAAAACCAGGCGTCTCGTCCCTATTCCCTTC 2730  
\*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\*

SEQIDNO\_14 TACTCGAGCCTTATTCTTATCCGGATGATCAGGAGCAAGGGCAGAACCTCGACACAAC 2820  
SEQIDNO\_18 TACTCGAGCCTTATTCTTATCCGGATGATCAGGAGCAAGGGCAGAACCTCGACACAAC 2820  
SEQIDNO\_16 TATTCTAGCCTTATTCTTATGAGGAAGATCAGAGGCAAGGAGCAGAACCTAGAAAAAAC 2790  
\*\* \* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\*

SEQIDNO\_14 TTCGTCCAGCCAAATGAAACAGAACTTACTTTTGGAAAGTGCAGCATCACATGGCACCC 2880  
SEQIDNO\_18 TTCGTCCAGCCAAATGAAACAGAACTTACTTTTGGAAAGTGCAGCATCACATGGCACCC 2880  
SEQIDNO\_16 TTTGTCAAGCCTAATGAAACCAAACTTACTTTTGGAAAGTGCACATCATATGGCACCC 2850  
\*\* \* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\*

SEQIDNO\_14 ACAGAAGACGAGTTTGACTGCAAAAGCCTGGGCTACTTTCTGATGTTGACCTGGAAAAA 2940  
SEQIDNO\_18 ACAGAAGACGAGTTTGACTGCAAAAGCCTGGGCTACTTTCTGATGTTGACCTGGAAAAA 2940  
SEQIDNO\_16 ACTAAAGATGAGTTTGACTGCAAAAGCCTGGGCTTATTTCTGATGTTGACCTGGAAAAA 2910  
\*\* \* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\*

SEQIDNO\_14 GATGTGCACTCAGGCTTGATCGGGCCCCCTTCTGATGCTCGCGCCCAACACCCCTGAACGCT 3000  
SEQIDNO\_18 GATGTGCACTCAGGCTTGATCGGGCCCCCTTCTGATGCTCGCGCCCAACACCCCTGAACGCT 3000  
SEQIDNO\_16 GATGTGCACTCAGGCTTGATGGACCCCTTCTGCTGCTGCCACACTAACACACTGAACCCCT 2970  
\*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\*

SEQIDNO\_14 GCTCAGGTAGACAAGTGACCGTGCAAGAAATTTGCTCTGTTTTTTCACATATTTTGTAGAG 3060  
SEQIDNO\_18 GCTCAGGTAGACAAGTGACCGTGCAAGAAATTTGCTCTGTTTTTTCACATATTTTGTAGAG 3060  
SEQIDNO\_16 GCTCATGGGAGACAAGTGACAGTACAGGAATTTGCTCTGTTTTTTCACCATCTTTGTAGAG 3030

Title: NUCLEIC ACID AND AMINO ACID SEQUENCES ENCODING HIGH-LEVEL  
EXPRESSOR FACTOR VIII POLYPEPTIDES AND METHODS OF USE

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***** ** ***** ** ** ***** ** *****
SEQIDNO_14      ACAAGAGCTGGTACTTCACTGAAAAATGTGGAAGAACTGCCGGCCCCCTGCCATCTG 3120
SEQIDNO_18      ACAAGAGCTGGTACTTCACTGAAAAATGTGGAAGAACTGCCGGCCCCCTGCCATCTG 3120
SEQIDNO_16      ACCAAAAGCTGGTACTTCACTGAAAAATATGGAAGAACTGCAGGGCTCCCTGCAATATC 3090
** ** ***** ** ***** ** ***** ** ***** ** *
SEQIDNO_14      CAGATGGAGGACCCCACTCTGAAAGAAAACATCGCTTCCATGCAATCAATGGCTATGTG 3180
SEQIDNO_18      CAGATGGAGGACCCCACTCTGAAAGAAAACATCGCTTCCATGCAATCAATGGCTATGTG 3180
SEQIDNO_16      CAGATGGAAGATCCCACTTTTAAAGAGAAATTATCGCTTCCATGCAATCAATGGCTACATA 3150
***** ** ***** * ***** ** ***** ***** *
SEQIDNO_14      ATGGATACACTCCCTGGCTTAGTAATGGCTCAGAATCAAAGGATCCGATGGTATCTGCTC 3240
SEQIDNO_18      ATGGATACACTCCCTGGCTTAGTAATGGCTCAGAATCAAAGGATCCGATGGTATCTGCTC 3240
SEQIDNO_16      ATGGATACACTACCTGGCTTAGTAATGGCTCAGGATCAAAGGATTCGATGGTATCTGCTC 3210
***** ***** ***** ***** ***** ***** *****
SEQIDNO_14      AGCATGGGCAGCAATGAAAAATATCCATTGATTCATTTTAGCGGACACGTGTTCAAGTGA 3300
SEQIDNO_18      AGCATGGGCAGCAATGAAAAATATCCATTGATTCATTTTAGCGGACACGTGTTCAAGTGA 3300
SEQIDNO_16      AGCATGGGCAGCAATGAAAAACATCCATTCTATTTCATTTTCAGTGGACATGTGTTCACTGA 3270
***** ***** ***** ***** ***** ***** *****
SEQIDNO_14      CGGAAAAAGGAGGAGTATAAAATGGCCGTGTACAATCTCTATCCGGGTGCTTTTGAGACA 3360
SEQIDNO_18      CGGAAAAAGGAGGAGTATAAAATGGCCGTGTACAATCTCTATCCGGGTGCTTTTGAGACA 3360
SEQIDNO_16      CGAAAAAAGAGGAGTATAAAATGGCACTGTACAATCTCTATCCAGGTGTTTITGAGACA 3330
** ***** ***** ***** ***** ***** *****
SEQIDNO_14      GTGGAATGCTACCGTCCAAAGTTGGAAATTGGCGAATAGAATGCCTGATTGGCGAGCAC 3420
SEQIDNO_18      GTGGAATGCTACCGTCCAAAGTTGGAAATTGGCGAATAGAATGCCTGATTGGCGAGCAC 3420
SEQIDNO_16      GTGGAATGTTTACCATCCAAAGCTGGAAATTGGCGGGTGAATGCCCTATTGGCGAGCAT 3390
***** ***** ***** ***** ***** ***** *****
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SEQIDNO\_14 CTGCAAGCTGGGATGAGCAGCACTTTCTCGGTGTACAGCAAGAAGTGTGAGACTCCCCTG 3480  
SEQIDNO\_18 CTGCAAGCTGGGATGAGCAGCACTTTCTCGGTGTACAGCAAGAAGTGTGAGACTCCCCTG 3480  
SEQIDNO\_16 CTACATGCTGGGATGAGCAGCACTTTTCTCGGTGTACAGCAATAAGTGTGAGACTCCCCTG 3450  
\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\*

SEQIDNO\_14 GGAATGGCTTCTGGACACATTAGAGATTTTCAGATTACAGCTTCAGGACAATATGGACAG 3540  
SEQIDNO\_18 GGAATGGCTTCTGGACACATTAGAGATTTTCAGATTACAGCTTCAGGACAATATGGACAG 3540  
SEQIDNO\_16 GGAATGGCTTCTGGACACATTAGAGATTTTCAGATTACAGCTTCAGGACAATATGGACAG 3510  
\*\*\*\*\*

SEQIDNO\_14 TGGGCCCAAGCTGGCCAGACTTCATTATTCCGGATCAATCAATGCCTGGAGCACCAG 3600  
SEQIDNO\_18 TGGGCCCAAGCTGGCCAGACTTCATTATTCCGGATCAATCAATGCCTGGAGCACCAG 3600  
SEQIDNO\_16 TGGGCCCAAGCTGGCCAGACTTCATTATTCCGGATCAATCAATGCCTGGAGCACCAG 3570  
\*\*\*\*\*

SEQIDNO\_14 GAGCCCTTTCTTGGATCAAGGTGGATCTGTGGCACCATGATTATTACGGCATCAAG 3660  
SEQIDNO\_18 GAGCCCTTTCTTGGATCAAGGTGGATCTGTGGCACCATGATTATTACGGCATCAAG 3660  
SEQIDNO\_16 GAGCCCTTTCTTGGATCAAGGTGGATCTGTGGCACCATGATTATTACGGCATCAAG 3630  
\*\*\*\*\*

SEQIDNO\_14 ACCCAGGTGCCCGTCAGAAGTTCCTCAGCCTCTACATCTCTCAGTTTATCATGTAT 3720  
SEQIDNO\_18 ACCCAGGTGCCCGTCAGAAGTTCCTCAGCCTCTACATCTCTCAGTTTATCATGTAT 3720  
SEQIDNO\_16 ACCCAGGTGCCCGTCAGAAGTTCCTCAGCCTCTACATCTCTCAGTTTATCATGTAT 3690  
\*\*\*\*\*

SEQIDNO\_14 AGTCTTGATGGGAAGAAGTGGCAGACTTATCGAGGAAATTCCTACTGGAACCTTAATGGTC 3780  
SEQIDNO\_18 AGTCTTGATGGGAAGAAGTGGCAGACTTATCGAGGAAATTCCTACTGGAACCTTAATGGTC 3780  
SEQIDNO\_16 AGTCTTGATGGGAAGAAGTGGCAGACTTATCGAGGAAATTCCTACTGGAACCTTAATGGTC 3750  
\*\*\*\*\*



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SEQIDNO_14      TTCTTTGGCAATGTGGATTTCATCTGGGATAAAACACAATATTTTAAACCCCTCCAATTATT 3840
SEQIDNO_18      TTCTTTGGCAATGTGGATTTCATCTGGGATAAAACACAATATTTTAAACCCCTCCAATTATT 3840
SEQIDNO_16      TTCTTTGGCAATGTGGATTTCATCTGGGATAAAACACAATATTTTAAACCCCTCCAATTATT 3810
*****
SEQIDNO_14      GCTCGATACATCCGTTTGCACCCAACTCATTATAGCATTCGCAGCACTCTTCGCATGGAG 3900
SEQIDNO_18      GCTCGATACATCCGTTTGCACCCAACTCATTATAGCATTCGCAGCACTCTTCGCATGGAG 3900
SEQIDNO_16      GCTCGATACATCCGTTTGCACCCAACTCATTATAGCATTCGCAGCACTCTTCGCATGGAG 3870
*****
SEQIDNO_14      TTGATGGGCTGTGATTTAAATAGTTGCAGCATGCCATTGGGAATGGAGAGTAAAGCAATA 3960
SEQIDNO_18      TTGATGGGCTGTGATTTAAATAGTTGCAGCATGCCATTGGGAATGGAGAGTAAAGCAATA 3960
SEQIDNO_16      TTGATGGGCTGTGATTTAAATAGTTGCAGCATGCCATTGGGAATGGAGAGTAAAGCAATA 3930
*****
SEQIDNO_14      TCAGATGCACAGATTACTGTTTCATCCTTACCTTACCAATATGTTTGGCCACCTGGTCTCCT 4020
SEQIDNO_18      TCAGATGCACAGATTACTGTTTCATCCTTACCTTACCAATATGTTTGGCCACCTGGTCTCCT 4020
SEQIDNO_16      TCAGATGCACAGATTACTGTTTCATCCTTACCTTACCAATATGTTTGGCCACCTGGTCTCCT 3990
*****
SEQIDNO_14      TCAAAAGCTCGACTTCACCTCCAAGGGAGGAGTAATGCCTGGAGACCTCAGGTGAATAAT 4080
SEQIDNO_18      TCAAAAGCTCGACTTCACCTCCAAGGGAGGAGTAATGCCTGGAGACCTCAGGTGAATAAT 4080
SEQIDNO_16      TCAAAAGCTCGACTTCACCTCCAAGGGAGGAGTAATGCCTGGAGACCTCAGGTGAATAAT 4050
*****
SEQIDNO_14      CCAAAAGAGTGGCTGCAAGTGGACTTCCAGAAGACAATGAAAGTCACAGGAGTAACTACT 4140
SEQIDNO_18      CCAAAAGAGTGGCTGCAAGTGGACTTCCAGAAGACAATGAAAGTCACAGGAGTAACTACT 4140
SEQIDNO_16      CCAAAAGAGTGGCTGCAAGTGGACTTCCAGAAGACAATGAAAGTCACAGGAGTAACTACT 4110
*****
SEQIDNO_14      CAGGGAGTAAATCTCTGCTTACCAGCATGTATGTGAAGGAGTTCCTCATCTCCAGCAGT 4200
SEQIDNO_18      CAGGGAGTAAATCTCTGCTTACCAGCATGTATGTGAAGGAGTTCCTCATCTCCAGCAGT 4200
SEQIDNO_16      CAGGGAGTAAATCTCTGCTTACCAGCATGTATGTGAAGGAGTTCCTCATCTCCAGCAGT 4170
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*****
SEQIDNO_14      CAAGATGGCCATCAGTGGACTCTCTTTTTCAGAAATGGCAAGTAAAGTTTTCAGGGA 4260
SEQIDNO_18      CAAGATGGCCATCAGTGGACTCTCTTTTTCAGAAATGGCAAGTAAAGTTTTCAGGGA 4260
SEQIDNO_16      CAAGATGGCCATCAGTGGACTCTCTTTTTCAGAAATGGCAAGTAAAGTTTTCAGGGA 4230
*****

SEQIDNO_14      AATCAAGACTCCTTCACACCTGTGGTGAACCTCTAGACCCACCGTTACTGACTCGCTAC 4320
SEQIDNO_18      AATCAAGACTCCTTCACACCTGTGGTGAACCTCTAGACCCACCGTTACTGACTCGCTAC 4320
SEQIDNO_16      AATCAAGACTCCTTCACACCTGTGGTGAACCTCTAGACCCACCGTTACTGACTCGCTAC 4290
*****

SEQIDNO_14      CTTCGAATTCACCCCCAGAGTTGGGTGCACCAGATTGCCCTGAGGATGGAGGTTCTGGGC 4380
SEQIDNO_18      CTTCGAATTCACCCCCAGAGTTGGGTGCACCAGATTGCCCTGAGGATGGAGGTTCTGGGC 4380
SEQIDNO_16      CTTCGAATTCACCCCCAGAGTTGGGTGCACCAGATTGCCCTGAGGATGGAGGTTCTGGGC 4350
*****

SEQIDNO_14      TCGGAGGCACAGGACCTCTAC 4401
SEQIDNO_18      TCGGAGGCACAGGACCTCTAC 4401
SEQIDNO_16      TCGGAGGCACAGGACCTCTAC 4371
*****
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